

A NEW SPECIES OF *LUPINUS* (FABACEAE) FROM OAXACA, MEXICO: A SHRUB OR TREE MOSTLY THREE TO EIGHT METERS HIGH

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ABSTRACT

A new species, *Lupinus Jaimehintoniana* B.L. Turner is described and photographed from near timberline on Cerro Quiexobra, Oaxaca, where it is a subdominant shrub or small tree up to 8 m high, the lower trunks markedly woody and up to 30 cm across. It appears to be closely related to *Lupinus montanus*, having most of the characters of that species, except for its woody habit, much-reduced leaves and stipules, silvery pubescence, and longer floral bracts.

KEY WORDS: Fabaceae, *Lupinus*, México, Oaxaca, systematics

Identification of Mexican plants has revealed the following novelty.

LUPINUS JAIMEHINTONIANA B.L. Turner, *spec. nov.* Figures 1, 2.
TYPE: MEXICO. Oaxaca: Mpio. Miahuatlán, Cerro Quiexobra, 3575 m, 15 Oct 1995, Hinton *et al.* 26160 (HOLOTYPE: TEX!; Isotype: TEX!).

Similis *Lupino montano* H.B.K. sed frutex vel arbor est, 8 m alto, foliis calium superiorum 5-7 foliola habentibus, stipulis 2-10 mm secus petiolos connatis, indumento pilorum curtorum et argenteorum sursum appresso.

Shrubs or trees mostly (1-)3-8 m high, the lower trunks up to 30 cm across. Flowering stems (of new growth) nodose, the vestiture of short silvery, upwardly appressed hairs ca. 0.2 mm long. Leaves at 2-4 nodes below the inflorescence having 5-7 leaflets; stipules 2-3 cm long, fused at the base to the petioles for 2-10 mm; petioles 4-7 cm long; leaflets narrowly elliptic, 3-6 cm long, 0.6-1.2 cm wide, moderately silky appressed-pubescent on both surfaces, the apices acute. Inflorescence a terminal spike 15-30 cm long, ca. 5 cm across. Bracts linear-lanceolate, much exceeding the flowers, markedly pubescent with appressed hairs above and below, the apices mostly narrowly acuminate. Pedicels mostly 7-8 mm

long, pubescent like the stems. Calyx with lower sepals lanceolate ca. 9 mm long (including the short tube), upper (united) lobes broadly ovate, ca. 6 mm long. Corollas reportedly purple; wing petals with claws ca. 3 mm long; blades broadly oval, glabrous, ca. 13 mm long, 9 mm wide, the upper 1/3 corrugate near its base; banner glabrous throughout, sessile or nearly so, ca. 12 mm long and as wide; keel petals glabrous with claws ca. 4 mm long, their blades ca. 7 mm long as measured along the basal axis, then sharply arcuate upwards, the apical axis nearly at right angle to that of the basal axis, the apices acute. Lower stamens with anthers ca. 2 mm long. Pods (immature) ca. 4 cm long, 0.8 cm wide, densely tomentose with contorted subawn hairs. Mature seeds not available.

ADDITIONAL SPECIMENS EXAMINED: MEXICO. Oaxaca: Mpio. Miahuatlán, Quiexobra, 3070 m, 19 Oct 1995, *Hinton et al.* 26228 (TEX); 35 km ESE of Miahuatlán, 5 km NE of Santo Domingo Ozolotepec, Cerro Quiexobra, "Timberline vegetation in open glades along ridges and in mountain saddles", 3650-3800 m, 10 Dec 1989, *McDonald* 2923 (TEX).

When first collected by Dr. Andrew McDonald (collection cited above), perhaps the first botanist to collect on Cerro Quiexobra, I was too busy with other projects to pursue its identification. Had I known its remarkable habit (as shown in figures 1 and 2) I most certainly would have sought its identity, although McDonald did describe or label the collection as being "Common subarborescent shrubs often forming dense stands along ridges, 1-3 m tall."

Lupinus jaimehintoniana appears to belong to the *L. montanus* Cerv. ex Lag. species complex, which was treated in some detail by Dunn & Harmon (1977). These authors recognized five species in the complex, one of these *L. montanus* having five infraspecific categories. Most of these taxa are confined to México and Guatemala and most were originally accepted as "good" species by yet earlier well known mavens of the genus in North America, mainly, C.P. Smith. As species are defined by most current workers in *Lupinus*, the various segregates from *L. montanus* (s.l.) rendered by Dunn & Harmon are about as distinct as yet other species in this or that complex. Nevertheless, were it not for the extraordinary habit of *L. jaimehintoniana* I would probably have followed Dunn & Harmon in recognizing it as but another infraspecific category of *L. montanus*, although having stipules quite different from the latter. In their treatment (1977) *L. jaimehintoniana* will key to *L. montanus* var. *nelsonii* (Rose) C.P. Smith, a taxon known only from eastern Oaxaca, mainly in the pine-fir forests in the sierras to the east of Cd. Oaxaca. In addition to its small stipules, it differs from *L. montanus* in having a silvery upturned vestiture on its stems (vs. tawny and down-curved or glabrous), and mostly longer floral bracts with somewhat contorted apices. *Lupinus montanus* is consistently described as a coarse herb or shrub 1-2 m high, the stems fistulose.

According to Dunn (1984), the largest lupine known to him at that time was a collection of *Lupinus* (the species not named) from Perú, said to be about 4.5 m high and possessing pendant flowering branches. As shown in figures 1 and 2, *Lupinus jaimehintoniana* can develop into relatively large trees, the inflorescences clearly borne terminal and erect.

As communicated by Jaime Hinton (nearly 80 years of age at the time of his ascent of Cerro Quiexobra, accompanied by his faithful friend and colleague, Anacleto Lugo):

. . . we trailed McDonald's [Dr. Andrew McDonald, currently Research Associate at Harvard University, who made the first extensive collections from Cerro Quiexobra in 1990] redoubtable footsteps over Quiexobra and up to the top of La Sirena (where, two years ago, a great fire reduced the four summits to tall grass and a few trees) . . . [I found myself] staring in "wild surmise" at the Lupine trees, as astonishing to the density of my ignorance as sudden fire to the human skin. (One badly burned and dying old Lupine graciously balanced its thirty feet of height on a real wooden trunk twelve inches across.)

Never in Quiexobra could I grow used to the miraculous blue Lupines held with such accomplished and heart-wringing majesty so high up in the air, as if, by God, who could ever have doubted that a Lupine could even more easily become a magnificent tree than a lovely herb? And I gazed with undying wonder at the beige-colored trunks of dead Lupines burning in the huge fires we built against the icen winds that drove us to bed, only a bit after sundown, as they mercilessly swept up at us from those Oaxacan sierras that by daylight appear tossed like the most gorgeous heaps of pale blue jewels across the whole wide northern world.

I reckon, Billie, Quiexobra does show the mightiest pines and firs still standing in Mexico. And I must admit my wonder at how well the Zapotec's earthen superstition has protected those mossy sprawling giants (*Chirathrodendron pentadactylon*, famed and held in awe for its flowers shaped like little human hands, richly yellow on one side and richly scarlet on the other) from the last few hundred years of mindless ax and fire.

Alas, the enterprising marihuaneros of to-day are no more able to control the rampage of the fires they themselves set to burn the forest for their secret and forbidden plantations, than their fabled stone gods were able to control the marauding rampage of the fiery Iberians.

Judging from its local abundance on Cerro Quiexobra, its resistance to fire and its adaptation to near timberline climates in México, it is likely that the species will prove hardy in the more temperate regions. At least it should prove interesting to ascertain through DNA analysis, *etc.*, what genes might be involved that permit its development into such a bizarre woody member of this otherwise mostly herbaceous genus.

It seems fitting that this remarkable lupine should bear the name of James Hinton, for he has collected with his father numerous lupine species, many of which are types and some of which already bear their names, including *Lupinus hintonii* C.P. Smith (for G.B. Hinton, the elder) and *L. hintoniorum* B.L. Turner (for the extended family).

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NOTES ON COSTA RICAN *PEPEROMIA* (PIPERACEAE), INCLUDING FOUR
NEW SPECIES

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ABSTRACT

Four new, ostensibly endemic, Costa Rican species of *Peperomia* are described: *Peperomia hammelii* Grayum, *P. saintpauliella* Grayum, and *P. trichomanoides* Grayum are all terrestrial or epilithic species restricted to the southern Pacific slope, mainly in limestone habitats. *Peperomia ursina* Grayum comprises epilithic or epiphytic plants from the lower Atlantic slope of the Cordillera de Talamanca. *Peperomia tenuifolia* C. DC., heretofore considered a synonym of *P. lignescens* C. DC., is reinterpreted as an older name for the species heretofore called *P. killipii* Trel. Revised synonymies are provided for *P. lignescens* and *P. tenuifolia*.

KEY WORDS: Costa Rica, *Peperomia*, Piperaceae, systematics

The Costa Rican members of the huge, pantropical genus *Peperomia* (Piperaceae) were most recently treated by Burger (1971), who accounted for 66 species. Since that time, intensive collecting efforts in previously underexplored regions of the country (particularly the Cordillera de Talamanca) have resulted in the addition of at least fifteen species to this total. Most of these additions have involved species already described from other countries, but a few appear to represent new taxonomic entities. Four new Costa Rican species of *Peperomia* are described hereunder, and a fifth additional species is freed from synonymy under a name accepted by Burger.

PEPEROMIA HAMMELII Grayum, *spec. nov.* TYPE: COSTA RICA. Puntarenas: Cantón de Osa, Fila Costeña, Fila Cruces, cabeceras del Río Piedras Blancas, Cerro Anguciana, faldas al oeste, bosque en roca de cal, 8° 48' 56" N, 83° 10' 37" W, 1,400-1,600 m, 10 Dec 1993, Hammel 19274 (HOLOTYPE: INB!; Isotypes: BM!, COL!, CR!, F!, MO!).

P. lignescens C. DC. affinis, a que imprimis differt caule trichomatibus multiseriatis vesicariis vestito petiolis in longitudinem late alatis laminis foliorum hirsutis pedunculis longioribus.

Plants terrestrial or epilithic. Stems erect, to ca. 23 × 0.2-0.5 cm, densely clothed with stout, multiseriate, inflated hairs to ca. 1 mm long. Leaves alternate. Petiole 1.2-4.6 cm, broadly alate throughout its length, ca. 2-6 mm wide, hirsute on both sides. Lamina 5.5-11.0 × 2.5-7.2 cm, ovate to broadly elliptic, impeltate, broadly cuneate to rounded or subcordate at base, subacute to subacuminate apically, pinnately nerved with ca. 5-6 primary lateral veins per side, dark-gland-dotted and hirsute on both surfaces. Inflorescences solitary at stem apex. Peduncle 2.7-3.8 cm, to ca. 1 mm wide, glabrous or with few scattered hairs toward base. Spike 1.7-8.5 × 0.2-0.4 cm, white. Flowers moderately separated; rachis glabrous; bracts 0.5-0.6 mm wide, suborbicular, densely glandular-punctate; anthers broadly elliptic to oblong, ca. 0.25 mm. Fruits unknown.

Peperomia hammelii is known only from the type locality, on the western slope of Cerro Anguciana, the highest peak in the Fila Costeña in the southern Pacific region of Costa Rica. Here, it grows on or near limestone cliffs or outcrops at 1,400-1,600 m elevation.

Peperomia hammelii is an unusually well-marked species in uniquely combining two features which, even by themselves, are anomalous within the genus: an indument of odd, inflated hairs, and broadly and extensively alate petioles. In its terrestrial or epilithic habitat, erect, caulescent habit, alternate, pinnately veined leaves and dark, sessile laminar glands it most closely resembles *P. lignescens* C. DC. and allies, to which it is perhaps intimately related. *Peperomia lignescens*, which is parapatric and at least conceivably syntopic with *P. hammelii*, differs from the latter in having generally puberulent or glabrescent (rather than hirsute) foliage and shorter peduncles (in addition to the characters mentioned previously).

I take great pleasure in dedicating this new species to its discoverer, Dr. Barry E. Hammel of the Missouri Botanical Garden, a long-time student of the Neotropical flora and my colleague on the "Manual to the Plants of Costa Rica" project.

Numerous Costa Rican collections have accrued in recent years of yet another *Peperomia* species that agrees in a general way with the description of *P. lignescens*, but which differs in having consistently palmate leaf venation. These collections are all from the humid Pacific lowlands (0-1,600 m), south from the Río Grande de Tácoles. They key out easily to *Peperomia killipii* Trel. in Yuncker's (1950) *Flora of Panama* treatment, and are an excellent overall match for the holotypes of *P. killipii* and its synonym (*vide* Yuncker) *P. hymenodes* Trel.

Peperomia lignescens was not treated by Yuncker (1950), while *P. killipii* was only briefly mentioned by Burger (1971: 65) in comparison with *P. pseudodependens* C. DC. (= *P. asarifolia* Schldl. & Cham.), a somewhat similar species that also has palmate venation. Due to the venation difference, *P. killipii* will not key out anywhere near *P. lignescens* in Burger's (1971) treatment. Nevertheless, type material of both *Peperomia aguacatensis* C. DC. and *P. tenuifolia* C. DC., two of the five heterotypic names listed in synonymy under *P. lignescens* by Burger (1971), agrees in all critical